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LIMONIUM IN NORTH AMERICA AND MEXICO.

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(Plates 118 and 119.)

THE first mention of a North American Sea Lavender in literature seems to have been made by Gronovius¹ in 1743. This record, based on Clayton's number 573, now in the British Museum, was included by Linnaeus² in the synonymy of *Statice Limonium* in the first edition of the *Species Plantarum*. Clayton's specimen has a peculiar calyx not matched by any other specimen examined and may be a hybrid of *L. carolinianum* and *L. trichogonum*.

Walter's *Statice caroliniana*, described from the coast of Carolina in 1788, was retained by Pursh and Nuttall but synonymized with *S. Limonium* by other early writers on American botany. Boissier in 1848 recognized it as distinct but confused two species under the name. Eight years later it was reduced by Gray to varietal rank under *S. Limonium*, a disposition maintained in the *Synoptical Flora* and in the sixth edition of Gray's *Manual*. Ever since its original publication the name has almost universally been considered to apply to the common northeastern species with a rather large calyx strongly pilose on the ribs and with acuminate lobes, but examination of Walter's type in the British Museum shows it to belong to the southern plant with smaller quite glabrous calyx with deltoid obtuse lobes which recent authors, following Gray, have identified with *Statice brasiliensis* Boiss.³ Type material of the latter in the Kew Her-

¹ Gron. Fl. Virg. ed. 1. 150 (1743).

² L. Sp. i. 274 (1753).

³ Boiss. in A. DC. Prod. xii. 644 (1848).

barium, however, differs widely in its verrucose branches and other characters from the plant of our southern coast, and the name *Limonium brasiliense* or *Statice brasiliensis* should disappear from the North American list. In the second edition of Britton & Brown's Illustrated Flora the range of "*L. carolinianum*" (not the plant of Walter) is extended to include Bermuda, thereby implying its identity with *L. Lefroyi* (Hemsl.) Britton¹ (*Statice Lefroyi* Hemsl.), which Wangerin² had already suggested in 1911. The type of that species in the Kew Herbarium, collected by Sir J. H. Lefroy at Walsingham, Bermuda, as well as other Bermudan material examined, represents a different species with the lobes of the villous-ribbed calyx merely short-deltoid, obtusish, and mucronulate, and our common plant of the northeast is left unprovided with a name.

In Boissier's monograph³ of *Statice* (= *Limonium*) in 1848 two species were recognized from North America — *S. caroliniana*, a mixture as to specimens of *Limonium angustatum* (Gray) Small, and of the northeastern species with strongly pubescent calyx to which Boissier's description exclusively applies; and the new *S. californica* from San Francisco (*Barclay*) and Santa Clara (*Sinclair*). In 1878, in the Synoptical Flora, Gray also recognized two species — the European *S. Limonium* L., represented in America by var. *caroliniana* and var. *californica*, and *S. brasiliensis* (= true *S. caroliniana*) with the new var. *angustata* from Florida. In 1897 Small raised var. *angustata* to specific rank under *Limonium*, and described *L. Nashii* from Florida, and in the following year *L. limbatum* from Texas and New Mexico, the latter said to be distinguished from *L. californicum* among other features by the "calyx...tube hirsute" in opposition to the "calyx...tube glabrous" of *L. californicum*, despite Boissier's description of *S. californica* as with the calyx-tube "ad 5 costas breviter hirsuto." This error is repeated in Small's Flora, where the species called *L. californicum* is apparently the one here described as *L. mexicanum*.

An important review of the *Statice Limonium* group has recently

¹ Britton, Journ. N. Y. Bot. Gard. vi. 154 (1905). *Statice Lefroyi* Hemsl. Journ. Bot. xxi. 105 (1883); Voy. Challenger Bot. i. pt. 1. 47. t. 4 (1884). The petals are described by Hemsley as shorter than the calyx-tube, but good material collected by *F. S. Collins* at the type locality (no. 244) shows this to be an incorrect observation due probably to the over-maturity of Hemsley's type. The petals are lavender and exceed the calyx by 1–1.5 mm.

² Wangerin, Zeitschr. Naturw. Halle lxxxii. 429 (1911).

³ Boiss. in A. DC. Prod. xii. 634 et seq. (1848).

been published by Wangerin,¹ who recognizes, in addition to the new *Statice Endlichiana* from Tamaulipas, the first species of the genus to be described from Mexico, six North American Species — *S. angustata* ("Small" = Gray) Wangerin, *S. brasiliensis* Boiss. (not seen from North America by Wangerin), *S. caroliniana* Walt., *S. californica* Boiss., *S. Nashii* (Small) Wangerin, and *S. limbata* (Small) Wangerin. Wangerin's discussion of the variation of these species, which is accompanied by a key and brief synonymy, makes this a very important contribution to the knowledge of the American species of the genus.

All the North American species are closely related to one another and belong to the sect. *Limonium* § *Genuinae* of Boissier's revision. The chief characters for specific discrimination are to be found in the pubescence, size, and form of the calyx-tube, in the shape of its lobes, the shape of the flowering bractlets, and the degree of aggregation of the flowers.

The generic name to be used for this genus in accordance with the International Code of Nomenclature is at present in some dispute, American authors using *Limonium* while English and Continental authorities for the most part still adhere to the usage of Boissier, applying *Statice* to the Sea Lavenders and using *Armeria* Willd. for the Thrifts, basing their case on the clause of Art. 45 of the International Rules which states that when a genus having no subdivision which can be regarded as its type is divided into two, the original name shall be retained for the segregate having the greater number of species. The history of the case in brief is as follows. The two genera were distinguished in their modern acceptation by Tournefort in 1700, and described and figured in his *Institutiones* (i. 341. t. 177). Linnaeus united them in the *Genera Plantarum* (ed. 1. 88. no. 252 (1737); ed. 5. 135. no. 348 (1754)) under the name *Statice*, quoting *Limonium* as a synonym, and remarking in his observations under the genus "*Statice authorum calyce communi triplici, florem subrotundum componit. Limonium authorum calyce communi imbricato flosculos serie oblonga exhibit.*" Of the thirteen species of *Statice* in the first edition of the *Species* (i. 274) one only, the first, is a Thrift, the others Sea Lavenders. The first binomialist to separate them was Miller, who in his *Gardener's Dictionary* ed. 8 (1768) returned to

¹ Wangerin, *Zeitschr. Naturw. Halle* lxxxii. 401-445 (1911).

the genera as proposed by Tournefort, as he had in the non-binomial Gardn. Dict. Abr. ed. 4 (1754), and as the non-binomialists Hill (Brit. Herb. 343, 345 (1756)) and Adanson (Fam. ii. 283 (1763)) did also. Miller reckons twelve species of *Limonium* and only three of *Statice*, and the proportion was nearly the same in the case of Hill and Adanson, so that if the provision of Art. 45 relating to the numerical composition of the segregates of a genus were strictly followed the name *Statice* would have to be used for the Sea Lavenders. It is a satisfaction to find a loophole of escape from this course, so repugnant alike to justice and to common sense in that the act of Miller (or Adanson) is taken as determining the application of the name (*Statice*) while his own use of it is absolutely reversed, in Linnaeus' notes on his combined genus quoted above. His "Statice authorum" and "Limonium authorum" even if not given definite rank can certainly, as Druce¹ has recently argued, be considered as subdivisions which came within the meaning of Art. 45 and fix the typical group of the genus, and the names *Limonium* and *Statice* be retained in their modern, which is also their original sense, in place of *Statice* and *Armeria* of Willdenow.² It should be noted that Willdenow's names are in point of priority in conflict with *Taxantheme* Neck.³ (1790) for *Statice* Willd.,⁴ and *Polyanthemum* Medic.⁵ (1791) for *Armeria*, and that the case will probably have to come before the next International Botanical Congress for settlement.

In the preparation of the present revision the material in the British Museum, the Kew Herbarium, and the Gray Herbarium,

¹ Druce, Journ. Bot. liii. 357 (1915).

² Willd. Enum. Hort. Berol. i. 333, 335 (1809).

³ Neck. Elem. i. 115 (1790).

⁴ The dubious genus *Plegorhiza* Mol. (Sag. Chil. "ed. 1. 164, 351 (1782)"; ed. 2. 140, 287 (1810)) was mentioned by Philippi many years ago ("Anal. Univ. Chil. 1861, 58"; Linnaea xxxiii. 220 (1864-65)) as a probable synonym of his *Statice chilensis*, and later compilers (Ind. Kew., Dalla Torre & Harms, Post & Kuntze) have followed him in referring the name to the synonymy of *Statice* Willd. (*Limonium*). Aside from the essential identity of Molina's vernacular name for his genus, "Guaycuru" — which, however, as Molina remarks, "proviene dalla lingua del Paraguay" and is evidently taken from Pernetty's account (Journ. Voy. Malouines i. 306 (1769), under date 4 Jan. 1764), cited by Molina, of a Paraguay *Limonium* considered by Molina identical with his *Plegorhiza* — with the name "Guaicurú" by which, according to Schmitthenner (Phil. l. c), *Statice chilensis* is popularly known, there seem to be few points of likeness in the two plants. Molina's description of the flowers of his plant as "senza calice; corolla monopetala campaniforme intiera; stami nove brevissimi; . . . stilo cortissimo" and his reference of it to the Enneandria Monogynia absolutely preclude the possibility of its identity with *Limonium*. It would seem that *Plegorhiza* should again take the place among the Genera Incertae Sedis which it held for a century after its publication.

⁵ Medic. "Staatsw. Vorles. churpf. phys. ökon. Ges. i. 228 (1791)."

including type material of all the species recognized except *L. Endlichianum*, has been examined, and my best thanks are due the authorities of these institutions for the opportunity to study the collections under their charge. Through the kindness of Dr. Otto Stapf of the Kew Herbarium tracings and fragments of several types have been acquired for the Gray Herbarium. Unless otherwise noted, all specimens cited are in the Gray Herbarium.

KEY TO SPECIES.

- Calyx glabrous (rarely with one or two hairs in nos. 2 and 3).
 - Branchlets loosely flowered; Atlantic coast species.
 - Calyx-lobes deltoid or oval, obtuse or rounded, 0.5(-1) mm. long; innermost bractlet oval, usually minutely retuse at the obtuse to rounded apex, 3.6 mm. long.....1. *carolinianum*
 - Calyx-lobes lance-ovate, acute, 0.7-1 mm. long; innermost bractlet broadly oblong, acute, 4.5 mm. long.....2. *angustatum*
 - Branchlets densely flowered; Pacific coast species.....3. *mexicanum*
- Calyx pubescent at least at base.
 - Calyx-limb erect.
 - Calyx (5.3) 6-7.5 mm. long, its lobes 1-1.7 mm. long.
 - Calyx pubescent only at extreme base, or sometimes on one or two of the ribs to the middle; outermost bractlet ovate, acute to acuminate, 1.8-2 mm. long.
 - Scape strongly branched from near the base, the branches flexuose-spreading; innermost bractlet broadly hyaline-margined, 5-6 mm. long.....4. *Endlichianum*.
 - Scape branched from near the middle, the branches spreading-ascending; innermost bractlet rather narrowly hyaline-margined, 3.8-4.5 mm. long.....5. *Nashii*
 - Calyx strongly pubescent to middle or beyond on all the ribs (rarely one or two of them only sparsely hairy); outermost bractlet oval, abruptly pointed, 2.5-3.5 mm. long.....6. *trichogonum*
 - Calyx 4.3-5.5 mm. long, the lobes 0.4-0.8 mm. long.
 - Calyx-lobes obtuse to subacute; hairs of calyx ca. 0.5-0.6 mm. long; branchlets loosely flowered; Atlantic coast species.
 - 7. *obtusilobum*
 - Calyx-lobes acute or acutish; hairs of calyx ca. 0.2-0.3 mm. long; branchlets densely flowered; Pacific coast species.
 - 8. *californicum*
 - Calyx limb wide-spreading.....9. *limbatum*

1. LIMONIUM CAROLINIANUM (Walt.) Britton (as to syn. only). Scape slender, solid, 2-6 dm. high. Leaves lance-spatulate to oblong-obovate, obtuse or retuse at the often cuspidate apex, tapering into a petiole about equal to blade, the lamina 5.3-17.5 cm. long, 1-5.2 cm. wide. Panicle pyramidal, 14.5-30.5 cm. wide, the flowers loosely secund on the ultimate branchlets; spikelets 1-2-flowered. Outermost bractlet of spikelet elliptic-ovate, often mucronulate or apiculate at the acute or acutish apex, with green midrib and base, broadly hyaline-margined above, 1.5-2.2 mm. long; middle ovate, hyaline,

obtuse, with greenish midrib, 2.5 mm. long; innermost oval, mostly minutely retuse at the obtusish to rounded apex, with green center and base and broad hyaline margin, 3.6 mm. long. Calyx funnel-form, glabrous, 4.5–5 (6.5) mm. long, the lobes deltoid or oval, obtuse or rounded, not mucronate, 0.5(–1) mm. long; intermediate teeth lanceolate to lance-oblong, obtuse, acutish, or retuse, about half as long. Petals apparently pale lavender. Fruit exceeding calyx. PLATE 118, fig. A.

Statice ? *caroliniana* Walt.! Fl. Carol. 118 (1788), not of most auth.; Chapm. Fl. S. U. S. ed. 1. 278 (1860) & ed. 3. 300 (1897), ex char.

Statice Limonium L. var. *caroliniana* (Walt.) Gray, Man. ed. 2. 270 (1856), as to syn. only; Gray, Syn. Fl. ii. pt. 1. 54 (1878), as to syn. only.

Limonium carolinianum (Walt.) Britton, Mem. Torr. Club v. 255 (1894), as to syn. only; not of later auth.

Statice brasiliensis Gray, Syn. Fl. ii. pt. 1. 54 (1878), as to specim. and descr., not *S. brasiliensis* Boiss. in A. DC. Prod. xii. 644 (1848).

Limonium brasiliense Small, Bull. Torr. Club xxiv. 488 (1897), but not as to *Statice brasiliensis* Boiss., the name-bringing synonym, nor *L. brasiliense* (Boiss.) Ktze. Rev. i. 395 (1891); *Limonium brasiliensis* Heller, Cat. N. Am. Pl. ed. i. 6 (1898), but not as to *S. brasiliensis* Boiss., the name-bringing synonym.

NORTH CAROLINA: Ocracoke, *M. A. Curtis*.

SOUTH CAROLINA: *Walter* (TYPE in Brit. Mus.).

FLORIDA: low black soil, near St. Petersburg, 19 Nov. 1907, *Mrs. C. C. Deam* 2943; Palm Key, 8 Dec. 1901, *Tracy* 7473 (distr. as *L. Nashii*); Cedar Keys, 1874, *Palmer* 332; without definite locality, *Ware*.

MEXICO: Tamaulipas: field near Santa Teresa, Oct. 1830, *Berlandier* 3179 (in part).

There is also a panicle in Brit. Mus. (herb. Roemer) labelled "*Statice nova species Carolina ita misit D. Decandolle qui in omnibus speciminibus folia deesse dicit.*" *Berlandier* 3179 is placed by *Wangerin* (l. c. p. 43) under *Statice Nashii*. Of the two specimens, of different dates (and perhaps confused), in the Gray Herbarium under that number one is *L. Nashii*, the other *L. carolinianum*. The latter differs from any others examined in its more densely flowered and rather stiffly erect branches and slightly less obtuse calyx-lobes, but it is somewhat approached in the former character by *Deam* 2943, and in the latter by *Palmer* 332. The calyx is also considerably larger (6.5 mm.) with larger teeth (1 mm.), having however the same shape. Further Mexican material may show its distinctness from *L. carolinianum*, but at present it does not seem advisable to distinguish it by a name.

2. *LIMONIUM ANGUSTATUM* (Gray) Small. Similar; leaves linear or linear-lanceolate to lanceolate, the blade 5.5–8.5 cm. long, 4.5–20.5 mm. wide, equalling or exceeding the petiole. Panicle 12.5–24

cm. wide, loosely flowered; spikelets apparently always 1-flowered. Outermost bractlet ovate, acute to acuminate, with hyaline margin, 2–2.5 mm. long; middle ovate, hyaline, with greenish midrib, acutely mucronate, 2.5–3 mm. long; innermost broadly oblong, acute, hyaline-margined, 4.5 mm. long. Calyx obconic, glabrous (rarely with one or two tiny hairs), 5.4–6.2 mm. long; lobes lance-ovate, acute, 0.7–1 mm. long; teeth bifid or entire, minute, about 0.2 mm. long. Otherwise as in *L. carolinianum*. PLATE 118, fig. B.

Statice caroliniana Boiss.! in A. DC. Prod. xii. 643 (1848), as to specim. in part, not Walt.

Statice brasiliensis Boiss. var. *angustata* Gray! Syn. Fl. ii. pt. 1. 54 (1878).

Limonium angustatum (Gray) Small, Bull. Torr. Club xxiv. 488 (1897).

Statice angustata (Small) Wangerin, Zeitsch. Naturw. Halle lxxxii. 439 (1911).

Statice brasiliensis Chapm. Fl. S. U. S. ed. 2. 634 (1883) & ed. 3. 300 (1897), ex char., not Boiss.

FLORIDA: salt marsh, Myers, Lee Co., July–Aug. 1900, *Hitchcock* 194; salt marsh, Pine Key, *Blodgett* (TYPE in Gray Herb.).

TEXAS: Galveston Bay, July 1847, *Lindheimer* (hb. Kew., fragm. in Gray Herb.); without definite locality, *Drummond* (hb. Kew., fragm. in Gray Herb.).

Although closely related to *L. carolinianum*, the present plant seems specifically distinct in characters of bractlets and calyx. *Hitchcock* 194 agrees in the latter features with the originals of *Blodgett* and must be referred to this species; its leaves however are much broader, and indicate that the narrow leaves by which the plant was first distinguished as a variety are an individual feature of no great importance. The specimens of *Lindheimer* and *Drummond* from Texas, cited by *Boissier* under *Statice caroliniana*, are certainly referable to the present species, and considerably extend the known range of the plant.

3. LIMONIUM **mexicanum** Blake, n. sp. Perenne erectum scapus glabrum e radice subcylindrica ca. 13 cm. longa 0.8 cm. crassa. Scapus subvalidus vix bracteatus supra mediam partem paniculate ramosus. Folia oblonga vel oblongo-obovata vel obovata apice rotundata vel retusa interdum cuspidulata glabra coriacea crassiuscula venosa sensim in petiolum cuneate angustata, lamina 4.7–21 cm. longa 1.8–7.3 cm. lata in petiolis 2–9.5 cm. longis. Panicula pyramidalis 1.6–3.5 dm. lata, ramis divergenti-ascendentibus, ramulis ultimis dense floriferis spicas 1.3–2 cm. longas formantibus; spiculis saepissime 2-floris. Bractea extima orbicularis vel late orbiculari-ovata obtusa vel acuta breviter mucronata infra herbacea crassula punctata margine hyalino donata 1.5–2.5 mm. longa; mediae oblongo-ovatae obtusae hyalinae; intima elliptico-obovata apice apiculata late hyalino-marginata 3.6–4 mm. longa. Calyx anguste infundibuliformis glaberrimus (rare sparsissime pubescens) 5-costatus 4.6–5.2

mm. longus, limbo albido erecto 5-lobato, lobis deltoideo-ovalibus apiculato-acutatis 0.5–0.7 mm. longis, dentibus intermediis subnullis. Petala coerulea.

Erect glabrous perennial, scapose from a subcylindric root about 13 cm. long, 0.8 cm. thick. Scape stoutish, scarcely bracted, paniculately branched above the middle. Leaves oblong, oblong-obovate, or obovate, rounded or retuse at the sometimes cuspidate apex, gradually narrowed into the petiole, glabrous, coriaceous, thickish, veiny, the blade 4.7–21 cm. long, 1.8–7.3 cm. wide, on petioles 2–9.5 cm. long. Panicle pyramidal, 1.6–3.5 dm. wide, the branches divergent-ascending, the ultimate branchlets densely flowered, forming spikes 1.3–2 cm. long; spikelets nearly always 2-flowered. Outermost bractlet orbicular or broadly orbicular-ovate, obtuse to acute, short-mucronate, with thickish punctate herbaceous body and hyaline margin, 1.5–2.5 mm. long; middle ones oblong-ovate, obtuse, hyaline; innermost elliptic-obovate, apiculate, broadly hyaline-margined, 3.6–4 mm. long. Calyx narrowly infundibuliform, glabrous (rarely with a few hairs), 5-ribbed, 4.6–5.2 mm. long, the whitish limb erect, 5-lobed; the lobes deltoid-oval, apiculate-acute, 0.5–0.7 mm. long; intermediate teeth obsolescent. Petals bluish. PLATE 118, fig. C.

Limonium californicum Small, Bull. Torr. Club xxv. 318 (1898), and Fl. S. E. U. S. 900 (1903), ex char., not *Statice californica* Boiss.

CALIFORNIA: San Diego, 1876, *Palmer* 216 (TYPES in Gray Herb. and Brit. Mus.); Ocean Beach, near San Diego, 17 Aug. 1894, *Mearns* 4036.

LOWER CALIFORNIA: Playa Maria, July–Oct. 1896, *Anthony* 117.

Anthony's collection of this species is of especial interest as affording the first West-Mexican collection of the genus. *Mearns* 4036 deviates slightly from the other collections in that some of the calyces bear a very few short hairs near the middle, but, as in the case of similar specimens of *L. angustatum*, the essentially glabrous character of the calyx is easily recognized and there is no danger of confusion with the species with strongly pubescent calyx (nos. 4–9).

4. LIMONIUM **Endlichianum** (Wangerin) Blake, n. comb. Glabrous. Leaves oblong, coriaceous, 8.5 cm. long, 2.5 cm. wide; petioles 5.5 cm. long. Scape 3.5 dm. high, strongly branched nearly from base, the primary branches flexuose-spreading, several times dichotomous, the secondary curved-ascending, partly sterile, the flowering branchlets very loose, slightly elongate, recurved, the spikelets 2-flowered, loose or somewhat approximate, the whole forming a very broad loose broom-like panicle. Outermost bractlet ovate, acute or shortly mucronulate, narrowly membranaceous-margined, 2 mm. long; middle hyaline, nearly 4 mm. long; inmost obtuse, usually incised at apex, broadly hyaline-margined, 5–6 mm. long. Calyx 7 mm. long, long-obconic, pilose at base along the two inner ribs; lobes lance-triangular, acute, 1.5 mm. long, three times as long as the intermediate teeth. Corolla bluish.

Statice Endlichiana Wangerin, Zeitsch. Naturw. Halle lxxxii. 441 (1911).

MEXICO: Tamaulipas: Rincón del Toro, on the exsiccated maritime creek Laguna Madre, June 1904, *R. Endlich* 549 (type in Herb. Berol.).

Not seen; description translated from Wangerin's original diagnosis. The species seems doubtfully distinct from *L. Nashii*.

5. LIMONIUM NASHII Small. Plant 2.7–8.4 dm. high, the scape solid. Leaves oblong or oblong-spatulate to obovate, obtuse or rounded or retuse at the barely mucronulate apex, narrowed into the petiole, the lamina 5–17 cm. long, 1.7–4.5 cm. wide, on petioles 4.5–16.5 cm. long. Scape paniculately much branched from near the middle, the panicle 1.8–3 dm. wide, the branches spreading-ascending, the ultimate branchlets loosely flowered; spikelets 1–2 (usually 1)-flowered. Outermost bractlet ovate, acute to acuminate, mucronate, hyaline-margined, 1.8–2 mm. long; middle oblong, erose at the obtuse apex, hyaline with distinct midrib, 2.5–4 mm. long; innermost elliptic, rounded or retuse, hyaline-margined, 3.8–4.5 mm. long. Calyx obconic, sparsely or rather densely short-pilose at extreme base and often on one or two of the ribs for about $\frac{1}{3}$ – $\frac{1}{2}$ their length, 6.2–6.8 mm. long; limb erect, whitish, 5-lobed; lobes lanceolate-ovate, acuminate, 1–1.5 mm. long; teeth very short and bifid or obsolescent. Petals violet. PLATE 118, fig. D.

Statice Limonium L. var. *carolinianum* Gray! Syn. Fl. ii. pt. 1. 54 (1878), in part, not *S. caroliniana* Walt.

Limonium Nashii Small! Bull. Torr. Club xxiv. 491 (1897); Harper, Bull. Torr. Club xxviii. 478 (1901) (Tybee Island, Georgia, *Harper* 748).

Statice Nashii (Small) Wangerin, Zeitschr. Naturw. Halle lxxxii. 440 (1911).

SOUTH CAROLINA: Morris Island, 1864, *Dr. Grosvenor*.

FLORIDA: Titusville, Brevard Co., 30 July–1 Aug. 1895, *Nash* 2305 (COTYPE COLL.).

TEXAS: Galveston Island, 23 Sept. 1901, *Tracy* 7474 (distr. as *L. californicum*); Galveston Bay, July 1842, *Lindheimer*.

MEXICO: Tamaulipas: maritime fields, May 1843, *Berlandier* 3179 (in part).

Tracy 6475, from St. Vincent, Florida, 4 Sept. 1899, is very puzzling, having the bractlets of *L. carolinianum*, a calyx 6.5 mm. long, pubescent at extreme base and on two of the ribs to middle or nearly so, and ovate merely acute calyx-lobes about 0.7 mm. long. It may be a hybrid of *L. carolinianum* and *L. Nashii*.

6. LIMONIUM **trichogonum** Blake, n. sp. Perenne pluriscaposum erectum 2–6 dm. altum et ultra. Folia obovata vel obovato-spathulata acuta vel obtusa valde cuspidata basi in petiolum cuneate angustata glabra penninervia, lamina 4–12.5 cm. longa, 1.2–4.8 cm. lata, in petiolis 3–15 cm. longis. Scapus fistulosus e medio paniculate ramosus; panicula plus minusve pyramidalis 1–3 dm. lata, ramis

adscendenti-patentibus laxifloris rectis vel paullum recurvis, spiculis 1-2-floris. Bractea extima suborbiculari-ovata vel ovalis valde mucronata hyalino-marginata 2.5-3.5 mm. longa; mediae oblongo-ovatae obtusae hyalinae; intima oblongo-ovalis obtusa vel rotundata irregulariter erosa late hyalino-marginata 4-5.5 mm. longa. Calyx cylindrico-obconicus costis 5 e basi ad mediam partem et supra valde pilosis (5.3) 6-7.5 mm. longus, limbo albido pallide lavendulaceo-tincto, lobis ovato-lanceolatis acuminatis 1.5-1.7 mm. longis, dentibus intermediis triangularibus saepius bifidis ad 0.3 mm. longis. Petala lavendulacea.

Erect perennial, several-scaped, 2-6 dm. high and more. Leaves obovate or obovate-spatulate, acute to obtuse, strongly cuspidate, cuneately narrowed into the petiole, glabrous, penninerved, the blade 4-12.5 cm. long, 1.2-4.8 cm. wide, on petioles 3-15 cm. long. Scape fistulose, paniculately branched from the middle; panicle more or less pyramidal, 1-3 dm. broad, the branches ascending-spreading, loosely flowered, straight or slightly recurved; spikelets 1-2-flowered. Outermost bractlet suborbicular-ovate to oval, strongly mucronate, hyaline-margined, 2.5-3.5 mm. long; inner oblong-ovate, obtuse, hyaline; innermost oblong-oval, obtuse or rounded, irregularly erose, broadly hyaline-margined, 4-5.5 mm. long. Calyx cylindrical-obconic, the five ribs strongly pilose to above the middle, (5.3) 6-7.5 mm. long, the limb palely lavender-tinged; lobes ovate-lanceolate, acuminate, 1.5-1.7 mm. long; intermediate teeth triangular, usually bifid, about 0.3 mm. long. Petals lavender. PLATE 119, fig. E.

Statice Limonium Bigelow, Fl. Bost. ed. 1. 75 (1814), and other early Amer. auth., not L.

Statice caroliniana Pursh, Fl. i. 212 (1814), not Walt.; Bigelow, Am. Med. Bot. ii. 51. t. 25 (1818), and auth., not Walt.; Boiss! in A. DC. Prod. xii. 643 (1848), as to descr., and specim. in part, not Walt.

Statice Limonium L. var. *carolinianum* (Walt.) Gray! Man. ed. 2. 270 (1856) and auth., excl. name-bringing syn.

Limonium carolinianum (Walt.) Britton, Mem. Torr. Club v. 255 (1894), and later auth., not *Statice caroliniana* Walt.; Britton & Brown, Ill. Fl. ed. 2. ii. 718 (1913), not *Statice caroliniana* Walt., and excl. Bermudan range.

Newfoundland to New Jersey, and probably further southward. Among the numerous specimens examined, the following may be cited:

NEWFOUNDLAND: *Miss Brenton* (hb. Kew., fragment in Gray Herb.).

LABRADOR: southern part, *Storer* ("passing to *bahusiensis*," Gray in sched.).

NEW BRUNSWICK: brackish sands, Neguac Island, 16 Sept. 1913, *Blake* 5666; brackish marsh along Black River, Loggieville, 5 Sept. 1913, *Blake* 5624 (TYPE in Gray Herb.).

PRINCE EDWARDS ISLAND: Bunbury, 28 Aug. 1912, *Fernald, Long & St. John* 7931; Mt. Stewart, 30 July 1912, *Fernald, Bartram, Long & St. John* 7930.

QUEBEC: Anse à Persil, Rivière du Loup, July 1913, *Bro. Victorin* 53.

NEW ENGLAND: common on the coast.

NEW YORK: Hawthorne Beach, Port Chester, 28 Aug. 1888, *L. M. Stabler*.

NEW JERSEY: Point Pleasant, Ocean Co., 8 Aug. 1908, *Bartram*; Atlantic City, 1884, *L. F. Ward*.

The commonest and most widespread of our species, and the only one found on the Atlantic coast north of North Carolina, so far as yet known. This beautiful species, well distinguished by its strongly pilose calyx with acuminate teeth 1.5–1.7 mm. long, has passed for more than a century as *Statice caroliniana* Walt., but the type of that species belongs to a very different species with glabrous calyx (see no. 1). Occasionally the hairs on one or two of the ribs are sparse, but even in such extreme cases a few may generally be found reaching to the middle of the tube or beyond. At least three of the ribs seem to be always strongly haired, and no sign of intergradation with the southern *L. Nashii* has yet been seen. A puzzling specimen from Virginia (*Clayton* 573, Brit. Mus.) has the calyx-teeth and other features of *L. trichogonum*, but the absolutely glabrous tube of *L. carolinianum*, and may be of hybrid origin.

7. **LIMONIUM obtusilobum** Blake, n. sp. Perenne scaposum erectum 2.9 dm. altum. Scapus tenuis supra subsimpliciter ramosus. Folia anguste lanceolato-spathulata acuta mucronata basi in petiolum angustata coriacea glabra vix venosa, lamina 3.5–4.5 cm. longa 4.5–6 mm. lata, in petiolis 3–4.5 cm. longis. Panicula subpyramidalis 1.2 dm. lata, ramis adscendentibus ramulis ultimis sublaxifloris rectis vel recurvatis spicas 1–2.2 cm. longas gerentibus; spiculis 1–(saepius)2-floris. Bractea extima ovata vel orbiculari-ovata obtusa vel subacuta non mucronata hyalino-marginata 1 mm. longa; mediae hyalinae ovaes obtusae; intima elliptica apice rotundata non mucronata hyalino-marginata 2.5 mm. longa. Calyx obconicus 4.3–4.7 mm. longus costas 5 secundum ad mediam partem plus minusve dense pilosus pilis 0.5–0.6 mm. longis, lobis 5 deltoideo-ovatis obtusis ad subacutis 0.4 mm. longis, dentibus intermediis subovalibus integris 0.1–0.2 mm. longis. Petala pallida.

Scapose erect perennial, 2.9 dm. high. Scape slender, subsimply branched above. Leaves narrowly lance-spatulate, acute, mucronate, narrowed into the petiole, coriaceous, glabrous, scarcely venose, the blade 3.5–4.5 cm. long, 4.5–6 mm. wide, on petioles 3–4.5 cm. long. Panicle subpyramidal, 1.2 dm. wide, the branches ascending, the ultimate branchlets rather loosely flowered, straight or recurved, bearing spikes 1–2.2 cm. long; spikelets 1–(usually)2-flowered. Outermost bractlet ovate or orbicular-ovate, obtuse or subacute, not mucronate, hyaline-margined, 1 mm. long; middle hyaline, oval, obtuse; innermost elliptic, rounded at apex, not mucronate, hyaline-margined, 2.5 mm. long. Calyx obconic, 4.3–4.7 mm. long, more or less densely pilose on ribs to the middle with hairs 0.5–0.6 mm. long;

lobes 5, deltoid-ovate, obtuse to subacute, 0.4 mm. long; intermediate teeth suboval, entire, 0.1–0.2 mm. long. Petals pale. PLATE 119, fig. F.

FLORIDA: without further data, *Chapman* (TYPE in Gray Herb.).

This new species, known only from a single specimen, is very distinct among eastern species in its combination of pilose calyx with short obtusish calyx-lobes. Were it not for its minute flowering bractlets, much smaller than any seen in *L. carolinianum*, it might perhaps be considered a hybrid of that species with *L. Nashii*. Further specimens are much to be desired to determine the exact habitat of the species and to test its status.

8. LIMONIUM CALIFORNICUM (Boiss.) Heller. Plant 2–4 dm. high and more. Leaves obovate or oblong-obovate, obtuse or rounded to retuse at the barely mucronulate apex, narrowed into the petiole, coriaceous, veiny, fleshy, the blade 4.5–16.5 cm. long, 1.5–5.5 cm. wide, on petioles 2–10 cm. long. Scape stoutish, solid, paniculately much branched usually from below the middle to apex. Panicle 3.5–35 cm. wide, subpyramidal, the branches strongly ascending, densely flowered at their apices, forming spikes 1–3.7 cm. long; spikelets 1–2-flowered, distichously arranged. Outermost bractlet elliptic, obtuse to acute, mucronate or apiculate, hyaline-margined, 2–2.5 mm. long; middle hyaline, with strong green midrib, subacute, 3.3 mm. long; innermost elliptic, obtusish to acutish, rarely subapiculate, hyaline-margined, 4 mm. long. Calyx obconic, 4.5–5.5 mm. long, the ribs pubescent to above the middle with short hairs ca. 0.2–0.3 mm. long; lobes deltoid-ovate, acute or acutish, 0.5–0.7 mm. long; intermediate teeth obsolescent or absent. PLATE 119, fig. G.

Statice californica Boiss.! in A. DC. Prod. xii. 643 (1848).

Statice Limonium L. var. *californicum* (Boiss.) Gray! in Brewer & Watson, Bot. Calif. i. 466 (1876); Syn. Fl. ii. pt. 1. 54 (1878), in part.

Limonium commune S. F. Gray var. *californicum* (Boiss.) Greene, Man. San Francisco Bay Reg. 235 (1894).

Limonium californicum (Boiss.) Heller, Cat. N. Am. Pl. ed. 1. 6 (Mar. 1898); Small, Bull. Torr. Club xxv. 318 (June 1898), as to name-bringing syn. only; Small, Fl. S. E. U. S. 900 (1903), as to name only.

Statice Limonium Rattan! Calif. Fl. 72 (1879), not L.

CALIFORNIA: salt marshes, Humboldt Bay, June 1878, *Rattan*; West Berkeley, June 1891, *Michener & Bioletti* 193; Oakland, 7 July 1881, *Jones* 2367 (Brit. Mus.); salt marshes, Oakland, 11 Aug. 1891, *Blankinship*: salt marshes, San Francisco, Oct. 1837, *Barclay* 1577 (COTYPE COLL.: Brit. Mus.); marshes, Palo Alto, 30 Aug. 1902, *C. F. Baker* 1516; Santa Clara, *Sinclair* (COTYPE COLL.: hb. Kew., tracing and fragm. hb. Gray); salt marshes, Wilmington, Oct. 1882, *Parish Bros.* 959; margins of bay, San Pedro, 6 Sept. 1904, *Abrams* 4184; without definite locality, 1846, *Frémont*.

9. LIMONIUM LIMBATUM Small. Plant 5 dm. high and more,

glaucous. Leaves obovate, rounded or retuse at the barely mucronulate apex, narrowed into the petiole, thick, leathery, venose, the blade 6–14 cm. long, 2.4–4.5 cm. wide, on petioles 5.5–10 cm. long. Scape stout, much branched from below the middle upwardly. Panicle large, 2.3–3 dm. wide and more, the branches divergent-ascending, the 2-flowered spikelets densely and distichously aggregated in 0.8–1.4 cm. long spikes on the ultimate branchlets. Outermost bractlet ovate-orbicular or orbicular, acute or acutish, mucronate or apiculate, hyaline-margined, 1–1.4 mm. long; middle oblong-oval, retuse at apex, hyaline with green midrib, 3 mm. long; innermost very firm, elliptic, rounded or retuse at apex, hyaline-margined, 3–3.5 mm. long. Calyx trumpet-shaped with wide-spreading limb, ca. 3.7 mm. long, two or three of the ribs pubescent to middle, the others generally only at extreme base or not at all; lobes deltoid-ovate, obtuse to acute, ca. 0.7 mm. long; intermediate teeth depressed-deltoid, about 0.2 mm. long, or obsolescent. "Corollas light blue." PLATE 119, fig. H.

Statice californica Torr.! in Sitgreaves' Rep. 167 (1853), not Boiss.

Statice Limonium L. var. *californicum* Gray! Syn. Fl. ii. pt. 1. 54 (1878), in part, not *S. californica* Boiss.

Limonium limbatum Small! Bull. Torr. Club xxv. 317 (1898).

Statice limbata (Small) K. Sch. in Just's Jahresber. xxvi. pt. 1. 390 (1900); Wangerin, Zeitschr. Naturw. Halle lxxxii. 441 (1911).

TEXAS: salt flats near Pecos City, 5–6 July 1900, Eggert.

NEW MEXICO: plains west of White Mts., Lincoln Co., alt. 1250 m., 19 July 1897, Wootton 172 (COTYPE COLL.); Zuni Mts., 1851, Woodhouse (COTYPE COLL.); near Escondido Creek, June 1851, Wright 1435 (COTYPE COLL.); Roswell, Chaves Co., alt. 1158 m., Aug. 1900, Earle 341 (Brit. Mus.).

The most distinct of all our species by reason of its flaring calyx-limb and very densely aggregated spikelets with strongly thickened bractlets.

EXPLANATION OF PLATES 118 AND 119.

PLATE 118. Fig. A. *Limonium carolinianum* (Walt.) Britton. 1, flowering branchlet, $\times 1\frac{1}{4}$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet of spikelet, $\times 9$; 4, innermost bractlet of spikelet, $\times 9$. Drawn from Tracy 7473.

Fig. B. *L. angustatum* (Gray) Small. 1, flowering branchlet, $\times \frac{9}{10}$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$; 5, lobe and tooth of fruiting calyx, $\times 18$. Drawn from type (Blodgett).

Fig. C. *L. mexicanum* Blake. 1, spike, $\times 2$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$; 5, lobe of fruiting calyx, $\times 18$. Drawn from type (Palmer 216).

Fig. D. *L. Nashii* Small. 1, portion of flowering branchlet, $\times 1\frac{1}{2}$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$. Drawn from cotype collection (Nash 2305).

PLATE 119. Fig. E. *L. trichogonum* Blake. 1, portion of flowering branchlet, $\times 1\frac{1}{4}$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$. Drawn from type (Blake 5624).

Fig. F. *L. obtusilobum* Blake. 1, flowering branchlet, $\times 2$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$. Drawn from type (Chapman).

Fig. G. *L. californicum* (Boiss.) Heller. 1, spike, $\times 2$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$. Drawn from fragments of cotype (Sinclair) in Gray Herb., except fig. 1 which is from Baker 1516.

Fig. H. *L. limbatum* Small. 1, spike, $\times 1\frac{1}{2}$; 2, fruiting calyx, $\times 9$; 3, outermost bractlet, $\times 9$; 4, innermost bractlet, $\times 9$. Drawn from cotype collection (Wootton 172).

DISCOVERY OF PRUNUS CUNEATA IN SOUTHERN NEW JERSEY.

BAYARD LONG.

DR. WITMER STONE'S *The Plants of Southern New Jersey*¹ bears a significant subtitle which must not be overlooked — *with Especial Reference to the Flora of the Pine Barrens*. His work was originally intended as a study of the Pine Barrens alone but upon the persuasion of the authorities of the New Jersey State Museum it was later enlarged to include the whole of southern New Jersey.

Of the life-areas of the southern part of the state, it is to be recalled that there may be recognized, besides the *Pine Barrens* and a *Maritime* region, the *Middle District* of West Jersey and the recently discovered *Coast Strip*² on the eastern edge of the Pine Barrens. (The *Cape May District* of Stone is really a complex of all the other areas.) It was well recognized at the time of publication that the original work done upon the Middle District and the Coast Strip was incomparably meager to that done upon the Pine Barrens. Many more species, it was felt, would be added in time to the Middle District flora, while the Coast Strip had been so slightly touched and so little systematized work done upon it, throughout its length, that its exploration was really only

¹ Ann. Rep. N. J. State Mus. 1910, 23-828 (1912).

² See Stone, Proc. Acad. Nat. Sci. Phila. 1907, 452 (1908) and *Bartonia*, i. 20 (1909).